

**IN THE CLAIMS**

Pursuant to 37 CFR §121(c), the claim listing, including the text of the claims, will serve to replace all prior versions of the claims, in the application.

Please cancel claims 5 and 16 without prejudice or disclaimer, and amend claims 1, 3, 10, 14, 15, 17 and 19 as follows:

1           1. (Currently Amended) An apparatus for operating and maintaining a private  
2 mobile communication service system using an internet protocol (IP) network, the private  
3 mobile communication service network having a private base station controller (pBSC)  
4 and a base station transceiver subsystem (BTS), said apparatus comprising:

5           a wireless system manager (WSM) for receiving operation/maintenance  
6 information from the pBSC through the IP network, processing the  
7 operation/maintenance information, creating an operation/maintenance control signal,  
8 and transmitting the operation/maintenance control signal to the pBSC through the IP  
9 network;

10           a hardware alarm collection unit mounted on the pBSC for collecting  
11 operation/maintenance information from at least one board and outputting the operation/  
12 maintenance information, and for receiving an operation/maintenance control signal from  
13 said at least one board and generating a reset signal for said at least one board; and

14           a base station controller main processor (BMP) responsive to the  
15 operation/maintenance information being received from the hardware alarm collection  
16 unit for ascertaining a link address and for transmitting the operation/maintenance  
17 information when the link address is the WSM, and responsive to the  
18 operation/maintenance control signal being received from the WSM ~~through~~ through the  
19 IP network for transmitting the operation/maintenance control signal to the hardware  
20 alarm ~~connecting~~ collection unit;

21 wherein the WSM comprises a maintenance function module for receiving the  
22 operation/maintenance information from the BMP, for providing a maintenance function  
23 including at least one of system status monitoring, system failure control and system  
24 tests, and for creating and outputting the operation/maintenance control signal; and

25 wherein the maintenance function module comprises:

26 a status manager for monitoring the status of processors of the system,  
27 various links and various devices;

28 a fault manager for collecting failures and alarms of the system, and for  
29 reporting them to an operator; and

30 a test manager for testing devices and processing test calls.

1 2. (Original) The apparatus as set forth in claim 1, wherein the IP network is a  
2 Fast Ethernet link.

1 3. (Currently Amended) The apparatus as set forth in claim 1, wherein the WSM  
2 further comprises:

3 an operation function module for receiving the operation information from the  
4 BMP, for providing operation functions including at least one of loading, configuration  
5 management and statistics measurement, and for creating and outputting the operation  
6 control signal; and

7 ~~a maintenance function module for receiving the operation/maintenance~~  
8 ~~information from the BMP, for providing a maintenance function including at least one of~~  
9 ~~system status monitoring, system failure control and system tests, and for creating and~~  
10 ~~outputting the operation/maintenance control signal; and~~

11 a general function module for receiving the operation/maintenance information  
12 from the BMP through the IP network, for outputting the operation information to the  
13 operation function module, for transmitting the maintenance information to the

14 maintenance function module, for receiving the operation/maintenance control signal  
15 from the operation module and the maintenance module, and for transmitting the  
16 operation/maintenance control signal to the BMP through the IP network.

1 4. (Original) The apparatus as set forth in claim 3, wherein the operation  
2 function module comprises:

3 a system loading manager for handling system loading;  
4 a configuration data manager for handling configuration management; and  
5 a statistics and measurement manager for handling a statistics and measurement  
6 function.

Claim 5. (Canceled)

1 6. (Original) The apparatus as set forth in claim 3, wherein the general function  
2 module comprises:

3 a WSM initialization manager for creating and managing application parts  
4 required for operation of the WSM;  
5 a local area network (LAN) interface manager for processing a LAN connection,  
6 and data transmission and reception with the system; and  
7 a user interface manager for providing a graphic user matching function.

1 7. (Original) The apparatus as set forth in claim 1, wherein the BMP comprises:

2 a local area network (LAN) interface for providing an interface with a LAN to  
3 allow an IP communication with the WSM;

4 an operation/maintenance information transmission unit responsive to the  
5 operation/maintenance information being received from the hardware alarm collection  
6 unit for ascertaining the link address, and for transmitting the operation/maintenance

7 information to the WSM through the LAN interface if the link address is the WSM; and

8 an operation/maintenance control signal transmission unit for receiving the  
9 operation/maintenance control signal from the WSM through the LAN interface, and for  
10 transmitting the operation/maintenance control signal to the hardware alarm collection  
11 unit.

1 8. (Original) The apparatus as set forth in claim 7, wherein the  
2 operation/maintenance information transmission unit comprises:

3 an operation/maintenance information receiving unit for receiving the  
4 operation/maintenance information from the hardware alarm collection unit; and

5 a link address ascertaining unit for ascertaining the link address of the  
6 operation/maintenance information received from the operation/maintenance information  
7 receiving unit, and for transmitting the operation/maintenance information to the WSM  
8 through the LAN interface if the link address is the WSM.

1 9. (Original) The apparatus as set forth in claim 7, wherein the  
2 operation/maintenance control signal transmission unit comprises:

3 an operation/maintenance control signal receiving unit for receiving the  
4 operation/maintenance control signal from the WSM through the LAN interface; and

5 an operation/maintenance control signal transmitting unit for transmitting the  
6 operation/maintenance control signal to the hardware alarm connecting unit.

1 10. (Currently Amended) A method of operating and maintaining a private  
2 mobile communication service system using an IP network, the private mobile  
3 communication service network having a pBSC and a base station transceiver system  
4 (BTS), said method comprising the steps of:

5 (a) ascertaining, at a base station main processor (BMP), a link address of

6 operation/ maintenance information of at least one board collected by a hardware alarm  
7 collection unit;

8 (b) when the link address is ascertained to be a wireless system manager (WSM),  
9 transmitting the operation/maintenance information to the WSM through the IP network  
10 and processing the operation/maintenance information at the WSM;

11 (c) creating an operation/maintenance control signal at the WSM and transmitting  
12 the operation/maintenance control signal to the BMP through the IP network; and

13 (d) transmitting, at the BMP, the operation/maintenance control signal to the  
14 hardware alarm collection unit, and creating and outputting, at the hardware alarm  
15 collection unit, a reset signal for said at least one board;

16 wherein step (b) comprises transmitting the operation/maintenance information to  
17 a maintenance function module of the WSM; and

18 wherein the method further comprises the steps of:

19 monitoring, at a status manager of the maintenance function module, the  
20 status of processors, various links and various devices;

21 at a fault manager of the maintenance function module, collecting failures  
22 and alarms and reporting them to an operator; and

23 at a test manager of the maintenance function module, testing devices and  
24 processing test calls.

1 11. (Original) The method as set forth in claim 10, wherein step (a) comprises:  
2 collecting, at the hardware alarm collection unit, the operation/maintenance  
3 information of the board and transmitting the operation/maintenance information to the  
4 BMP; and

5 ascertaining, at the BMP, the link address of the operation/maintenance  
6 information.

1           12. (Original) The method as set forth in claim 10, wherein step (b) comprises:  
2           when the link address is ascertained to be the WSM, transmitting, at the BMP, the  
3 operation/maintenance information to the WSM through the IP network;  
4           receiving, at a general function module of the WSM, the operation/maintenance  
5 information through the IP network;  
6           transmitting, at the general function module, the operation information to an  
7 operation function module to process the operation information; and  
8           transmitting, at the general function module, the maintenance information to a  
9 maintenance module to process the maintenance information.

1           13. (Original) The method as set forth in claim 10, wherein step (d) comprises:  
2           receiving, at the BMP, the operation/maintenance control signal through the IP  
3 network;  
4           transmitting, at the BMP, the operation/maintenance control signal to the hardware  
5 alarm collection unit; and  
6           creating and outputting, at the hardware alarm collection unit, the reset signal for  
7 the board.

1           14. (Currently Amended) In an apparatus for operating and maintaining a private  
2 mobile communication service system using an internet protocol (IP) network, the private  
3 mobile communication service network having a private base station controller (pBSC)  
4 and a base station transceiver subsystem (BTS); a wireless system manager (WSM)  
5 comprising:  
6           operation function module means for receiving operation information, for  
7 providing operation functions including at least one of loading, configuration  
8 management and statistics measurement, and for creating and outputting an operation  
9 control signal;

10 maintenance function module means for receiving operation/maintenance  
11 information, for providing a maintenance function including at least one of system status  
12 monitoring, system failure control and system tests, and for creating and outputting an  
13 operation/maintenance control signal; and

14 general function module means for receiving the operation/maintenance  
15 information, for outputting operation information to the operation function module  
16 means, for transmitting maintenance information to the maintenance function module  
17 means, for receiving the operation control signal from the operation module means and  
18 the operation/maintenance control signal from the maintenance module means, and for  
19 transmitting the operation/maintenance control signal through the IP network;

20 wherein the maintenance function module means comprises:

21 a status manager for monitoring the status of processors of the system,  
22 various links and various devices;

23 a fault manager for collecting various failures and alarms of the system and  
24 reporting them to an operator; and

25 a test manager for testing various devices and processing test calls.

1 15. (Currently Amended) In the apparatus ~~as set forth in~~ of claim 14, wherein the  
2 operation function module means comprises:

3 a system loading manager for handling system loading;

4 a configuration data manager for handling configuration management; and

5 a statistics and measurement manager for handling a statistics and measurement  
6 function.

Claim 16. (Canceled)

1           17. (Currently Amended) In the apparatus ~~as set forth in~~ of claim 14, wherein the  
2       general function module comprises:

3           a WSM initialization manager for creating and managing application parts  
4       required for operation of the WSM;

5           a LAN interface manager for processing LAN connection and data transmission  
6       and reception with the system; and

7           a user interface manager for proving a graphic user matching function.

1           18. (Original) In the apparatus of claim 14, said apparatus further comprising a  
2       hardware alarm collection unit mounted on the pBSC for collecting the  
3       operation/maintenance information from at least one board and outputting the operation/  
4       maintenance information, and for receiving the operation/maintenance control signal  
5       from said at least one board and generating a reset signal for said at least one board.

1           19. (Currently Amended) In the apparatus of claim 14, said apparatus further  
2       comprising a base station controller main processor (BMP) responsive to the  
3       operation/maintenance information being received for ascertaining a link address and for  
4       transmitting the operation/maintenance information when the link address is the WSM,  
5       and responsive to the operation/maintenance control signal being received from the WSM  
6       ~~though~~ through the IP network for transmitting the operation/maintenance control signal  
7       to a hardware alarm connecting unit.

1           20. (Original) In an apparatus for operating and maintaining a private mobile  
2       communication service system using an internet protocol (IP) network, the private mobile  
3       communication service network having a private base station controller (pBSC) and a



4 base station transceiver subsystem (BTS); a base station main controller main processor  
5 (BMP) comprising:

6 a local area network (LAN) interface for providing an interface with a LAN to  
7 allow an IP communication;

8 an operation/maintenance information transmission unit responsive to reception of  
9 operation/maintenance information for ascertaining a link address, and for transmitting  
10 the operation/maintenance information through the LAN interface when the link address  
11 is a certain address; and

12 an operation/maintenance control signal transmission unit for receiving an  
13 operation/maintenance control signal through the LAN interface, and for transmitting the  
14 operation/maintenance control signal to a hardware alarm collection unit.